

wilkinsonstar.com



Plasma 25C

Air Plasma Cutting machine
Order code JP-25C



OPERATOR MANUAL

Your new product

Thank you for selecting this Jasic Technology, Wilkinson Star product.

This product manual has been designed to ensure that you get the most from your new product. Please ensure that you are fully conversant with the information provided paying particular attention to the safety precautions. The information will help protect yourself and others against the potential hazards that you may come across.

Please ensure that you carry out daily and periodic maintenance checks to ensure years of reliable and trouble free operation.

Wilkinson Star Limited are a leading supplier of equipment in the UK and our products are supported by our extensive service network. Call your distributor in the unlikely event of a problem occurring. Please record below the details from your product as these will be required for warranty purposes and to ensure you get the correct information should you require assistance or spare parts.

Date purchased _____

From where _____

Serial Number _____

(The serial number will normally be located on the equipment data plate on the underside of the machine or on the rear panel)

Please note products are subject to continual development and may be subject to change without notice

1

Safety Precautions



These general safety norms cover both arc welding machines and plasma cutting machines unless otherwise noted.

The equipment must only be used for the purpose it was designed for. Using it in any other way could result in damage or injury and in breach of the safety rules.

Only suitably trained and competent persons should use the equipment. Operators should respect the safety of other persons.



Prevention against electric shock

The equipment should be installed by a qualified person and in accordance with current standards in operation. It is the users responsibility to ensure that the equipment is connected to a suitable power supply. Consult with your utility supplier if required

If earth grounding of the work piece is required, ground it directly with a separate cable.

Do not use the equipment with the covers removed.

Do not touch live electrical parts or parts which are electrically charged.

Turn off all equipment when not in use.

Cables (both primary supply and welding) should be regularly checked for damage and overheating. Do not use worn, damaged, under sized, or poorly jointed cables.

Ensure that you wear the correct protective clothing, gloves, head and eye protection.

Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work ground.

Never touch the electrode if you are in contact with the work ground, or another electrode from a different machine.

Do not wrap cables over your body.

Ensure that you take additional safety precautions when you are welding in electrically hazardous conditions such as damp environments, wearing wet clothing, and metal structures. Try to avoid welding in cramped or restricted positions.

Ensure that the equipment is well maintained. Repair or replace damaged or defective parts immediately. Carry out any regular maintenance in accordance with the manufacturers instructions.



Safety against fumes and welding gases

Locate the equipment in a well-ventilated position.

Keep your head out of the fumes. Do not breathe the fumes.

Ensure the welding zone is in a well-ventilated area. If this is not possible provision should be made for suitable fume extraction.

If ventilation is poor, wear an approved respirator.

Read and understand the Material Safety Data Sheets (MSDS's) and the manufacturer's instructions for metals, consumable, coatings, cleaners, and de-greasers.

Do not weld in locations near any de-greasing, cleaning, or spraying operations. Be aware that heat and rays of the arc can react with vapours to form highly toxic and irritating gases.

Do not weld on coated metals, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings on many metals can give off toxic fumes if welded.



Prevention against burns and radiation

Arc rays from the welding process produce intense, visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin.

Wear an approved welding helmet fitted with a proper shade of filter lens to protect your face and eyes when welding or watching

Wear approved safety glasses with side shields under your helmet.

Never use broken or faulty welding helmets.

Always ensure there are adequate protective screens or barriers to protect others from flash, glare and sparks from the welding area. Ensure that there are adequate warnings that welding or cutting is taking place.

Wear suitable protective flame resistant clothing.

The sparks and spatter from welding, hot work pieces, and hot equipment can cause fires and burns

Welding on closed containers, such as tanks, drums, or pipes, can cause them to explode.

Accidental contact of electrode to metal objects can cause arcs, explosion, overheating, or fire.

Check and be sure the area is safe and clear of inflammable material before carrying out any welding.



Protection against noise

Some welding and cutting operations may produce noise.

Wear safety ear protection to protect your hearing.



Protection from moving parts

When the machine is in operation keep away from moving parts such as motors and fans. Moving parts, such as the fan, may cut fingers and hands and snag garments.

Protections and coverings may be removed for maintenance and controls only by qualified personnel, after first disconnecting the power supply cable.

Replace the coverings and protections and close all doors when the intervention is finished, and before starting the equipment.

Take care to avoid getting fingers trapped when loading and feeding wire during set up and operation.

When feeding wire be careful to avoid pointing it at other people or toward your body.

Always ensure machine covers and protective devices are in operation.



Precautions against fire and explosion

Avoid causing fires due to sparks and hot waste or molten metal

Ensure that appropriate fire safety devices are available near the cutting / welding area.

Remove all flammable and combustible materials from the cutting / welding zone and surrounding areas

Do not cut/weld fuel and lubricant containers, even if empty. These must be carefully cleaned before they can be cut/welded.

Always allow the cut/welded material to cool before touching it or placing it in contact with combustible or flammable material.

Do not work in atmospheres with high concentrations of combustible fumes, flammable gases and dust.

Always check the work area half an hour after cutting to make sure that no fires have begun.



Risks due to magnetic fields

The magnetic fields created by high currents may affect the operation of pacemakers or electronically controlled medical equipment.

Wearers of vital electronic equipment should consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

Do not go near welding equipment with any sensitive electronic equipment as the magnetic fields may cause damage.

RF Declaration

Equipment that complies with directive 2004/108/EC concerning electromagnetic compatibility (EMC) and the technical requirements of EN60974-10 is designed for use in industrial buildings and not those for domestic use where electricity is provided via the low voltage public distribution system. Difficulties may arise in assuring class A electromagnetic compatibility for systems installed in domestic locations due to conducted and radiated emissions.

In the case of electromagnetic problems, it is the responsibility of the user to resolve the situation. It may be necessary to shield the equipment and fit suitable filters on the mains supply.

LF Declaration

Consult the data plate on the equipment for the power supply requirements.

Due to the elevated absorbance of the primary current from the power supply network, high power systems affect the quality of power provided by the network. Consequently, connection restrictions or maximum impedance requirements permitted by the network at the public network connection point must be applied to these systems.

In this case the installer or the user is responsible for ensuring the equipment can be connected, consulting the electricity provider if necessary.



Materials and their disposal



The equipment is manufactured with materials, which do not contain any toxic or poisonous materials dangerous to the operator.

When the equipment is scrapped, it should be dismantled separating components according to the type of materials.

Do not dispose of the equipment with normal waste. The European Directive 2002/96/EC on Waste Electrical and Electronic Equipment states the electrical equipment that has reached its end of life must be collected separately and returned to an environmentally compatible recycling facility.



Handling of Compressed gas cylinders and regulators

All cylinders and pressure regulators used in welding operations should be handled with care.

Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.

Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

Always secure the cylinder safely

Never deface or alter any cylinder

2

Product Overview

CUT25 is a plasma cutting machine model developed from the original CUT series plasma cutting machines. It inherits the mature and stable inverter technology of CUT series: With PWM technology and high-power MOSFET switching devices, it converts the DC voltage, which is rectified from 50Hz/60Hz input AC voltage, to 100KHz AC high voltage. Then, the voltage is dropped and rectified, providing a high-power DC cutting is output.

The CUT series uses a non-HF arc ignition with pilot arc. This reduce EMI emissions during the arc start. Therefore, non-HF arc ignition with pilot arc should be used when higher requirement on electromagnetic environment is needed, e.g. in CNC cutting. The CUT25 is designed for such high-end application. In addition, CUT25 adopts a single PCB structure. An external air source connection is unnecessary, since it is equipped with an internal air compressor. Both contact and non-contact mode is available for successful arc ignition, and the 3s pilot arc time auto control inside the machine effectively reduces the wear of torch nozzle. The machine has such advantages as simple internal structure, small size, easy to ignite arc and convenient to use.

Product functions

- Internal air compressor is equipped, and external air source connection is unnecessary.
- Fixed current output

Product performance characteristics

Economical and practical by using compressed air as the plasma gas source.

The cutting speed is increased by 1.8 times when compared with oxy-acetylene cutting.

- It can cut thin steel plate conveniently and quickly.
- Easy to ignite arc, pre-flow and post-flow function available.
- It has a wide range of use, especially for cutting stainless steel, copper, cast iron and aluminum, etc.
- Simple operation



- Excellent cut quality
- Both contact and non-contact mode is available for successful arc ignition.

3

Technical data

MODEL	CUT25
Rated input voltage (V)	230V AC±10%
Rated input frequency (Hz)	50/60
Rated input capacity (KVA)	3.5
No-load voltage (V)	230±15
Cutting current (A)	25
Rated output voltage (V)	90
Rated duty cycle (%)	35
Efficiency (%)	85
Power factor	0.7
Insulation class	F
Protection class	IP21S
Arc ignition	Contact/non-contact ignition
Maximum cutting thickness (mm)	8
Weight (kg)	18
Overall size (mm) (L×W×H)	430×199×335

Tested at the environment temperature of 40° C

Product design may vary due to customer requirements.

Cutting speed guide

Cutting thickness (mm)	1	2	3	4	5	6	8
Mild steel	7		1.4			0.3	0.2
Galvanised	7		1.4			0.3	0.2
Stainless steel	7		1.4			0.3	0.2
Aluminium	5		1.2			0.2	
Brass	0.7		0.2				
Copper	0.7		0.2				

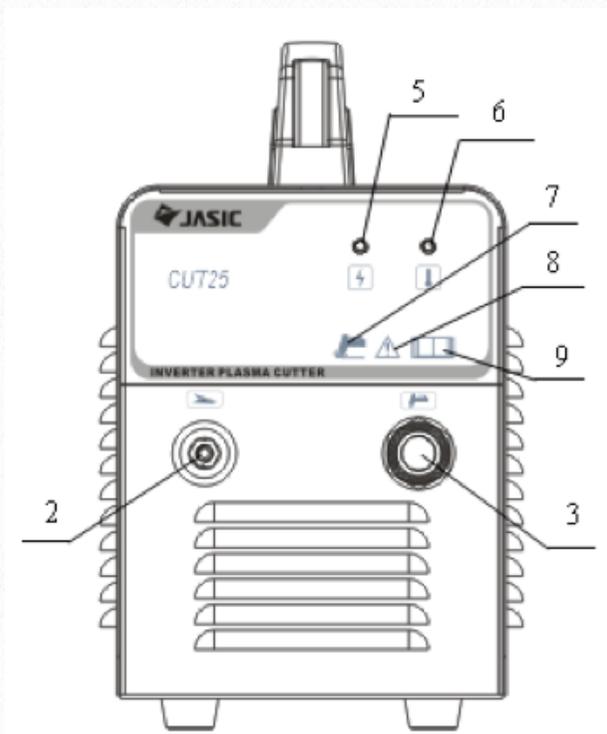
Cutting speed {m/mm)

4

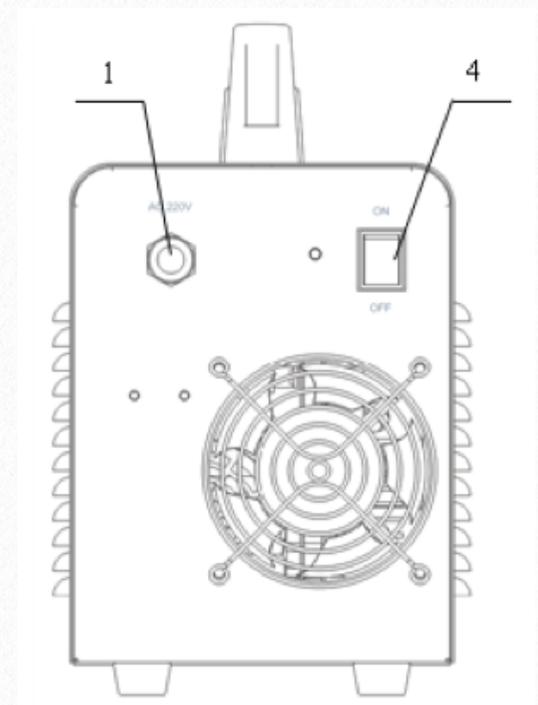
Controls

1. **Input cable**
2. **Work return cable socket**
3. **Torch connection.**
4. **Mains switch-**
5. **Power led** - It indicates that the input power is normal.
6. **Overheat led.**- This indicator will turn on when the machine is overheated due to overload or over current and the output has been disabled. Leave the machine on to allow the internal components to cool. When the indicator turns off, normal operation is again possible.
- 7, 8, 9 Warning indicator legends.

Front



Rear



5

Installation

Unpacking

Check the packaging for any signs of damage.

Carefully remove the machine and retain the packaging until the installation is complete.

Location

The machine should be located in a suitable position and environment. Care should be taken to avoid moisture, dust, steam, oil or corrosive gases

Place on a secure level surface and ensure that there is adequate clearance around the machine to ensure natural airflow.

Input connection

Before connecting the machine you should ensure that the correct supply is available. Details of the machine requirements can be found on the data plate of the machine or in the technical parameters shown in the manual.

The equipment should be connected by a suitably qualified competent person. Always ensure the equipment has a proper grounding.

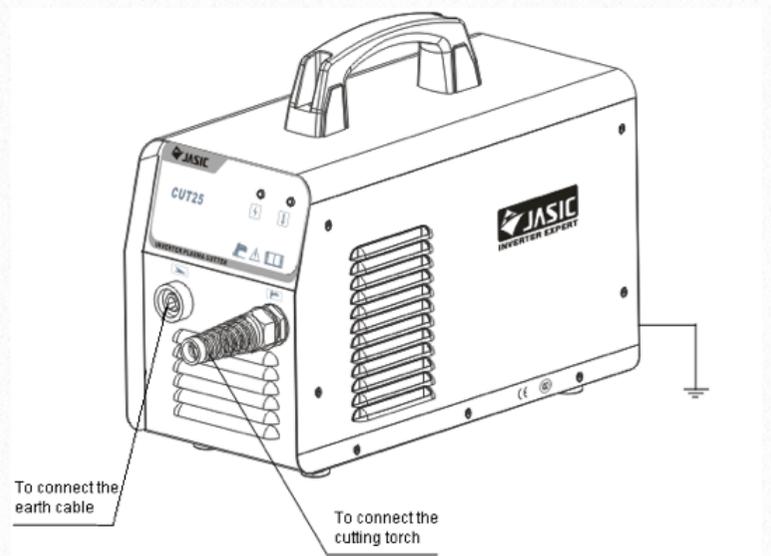
Never connect the machine to the mains supply with the panels removed.

Connection of work cable

Insert the quick plug on the work cable into the quick socket at the bottom of the front panel of the machine, and tighten it clockwise. Clamp the workpiece with the work clamp at the other end of the earth cable.

Connection of cutting torch

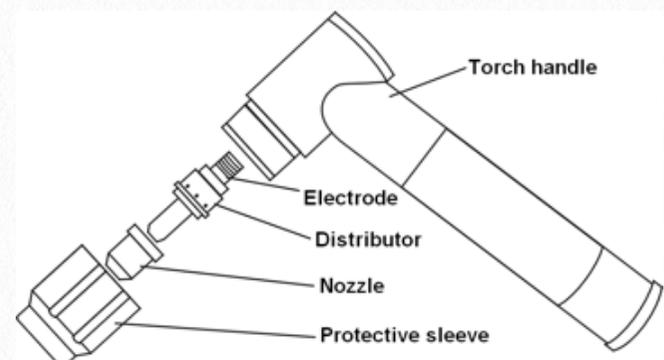
The cutting torch of this machine is fixed into the machine, and users do not need to connect it for themselves.



Installation of the cutting torch

- 1) Screw the end of the electrode with screw thread into the torch head, and tighten it.
- 2) Insert the other end of the electrode into the distributor.
- 3) Connect the nozzle with the electrode and distributor.
- 4) Connect the protective sleeve with the nozzle, screw it into the torch head, and tighten it.

Note: Screw the electrode into the torch with an inner hexagon spanner, and tighten it. Otherwise, the inner thread of the electrode will be burned.



Operation

Before starting any cutting activity ensure that you have suitable eye protection and protective clothing. Also take the necessary steps to protect any persons within the area.

Check that all connections have been made as shown above

Check the following before starting the machine.

- 1) Check if the machine is reliably grounded according to the relevant standard.
- 2) Check that there are no bad contacts.
- 3) Check if the power cord is connected to the correct input voltage.
- 4) Check if the connecting cables and gas hoses are in good condition and are not twisted.

Operation

- 1) Turn on the power switch on the back panel of the machine, and the power LED is on.
- 2) Press the control button on the cutting torch: The solenoid valve will operate, the air compressor starts, and there is plasma arc output from the nozzle of the cutting torch.
- 3) Non-contact arc ignition: Keep a distance of about 1~2mm between the copper nozzle of the cutting torch and the workpiece, and then press the control button on the cutting torch. After arc is ignited, cutting can be carried out. Contact arc ignition: Bring the copper nozzle of the cutting torch into contact with the workpiece, and then press the control button on the cutting torch. After arc is ignited, decline the cutting torch to the position about 1~2mm above the workpiece. And then, cutting can be carried out.

It is recommended that a torch of maximum length of 4 metres is used. If the torch cable is too long, the performance of this cutting machine such as arc ignition will be possibly affected due to the fact that the inner resistance of the cable will reduce the output voltage.

Notes for cutting operation

- 1) Do not touch the hot workpiece with bare hands to avoid burning.
- 2) It is recommended not to ignite the arc in the air if not necessary, for it will shorten the lifespan of the electrode and nozzle of the torch.

3) It is recommended to initiate the cutting from the edge of workpiece, unless penetration is needed.

4) Ensure spatter comes from the bottom of workpiece while cutting. If spatter comes upward from the top of workpiece, it indicates that the workpiece has not been fully cut through. This could be due to not enough power or the cutting torch is moved too fast.

5) Keep the nozzle slightly touching the workpiece when starting or keep a short distance between the nozzle and workpiece. If the torch is pressed against the workpiece, the nozzle may stick to the workpiece, and smooth cutting is unavailable.

6) For cutting a round workpiece or to meet precise cutting requirement, a stencil board or other tools are needed.

7) It is recommended to pull the cutting torch while cutting.

8) Keep the nozzle of cutting torch upright over the workpiece, and check if the arc is moving with the cutting line. Do not bend the cable too much, step on or press upon the cable to avoid restricting the air flow. The cutting torch may be burned if the air flow is too low. Keep the cutting cable away from sharp edges.

9) When the workpiece is nearly cut off, slow down the cutting speed and release the torch trigger to stop cutting.

10) Maintain the torch consumables frequently to prolong the life

11) Always ensure the correct consumables are fitted in the torch. Incorrect items may cause damage to the torch or machine

For welder training please visit our Academy website at

www.wilkinson-welding-academy.com

6

Maintenance and troubleshooting

The following operation requires sufficient professional knowledge on electric aspects and comprehensive safety knowledge. Make sure the input cable of the machine is disconnected from the electricity supply and wait for 5 minutes before removing the machine covers.

In order to guarantee that the arc welding machine works efficiently and in safety, it must be maintained regularly. Operators should understand the maintenance methods and means of arc welding machine operation. This guide should enable customers to carry on simple examination and safeguarding by oneself, try to reduce the fault rate and repair times of the arc welding machine, so as to lengthen service life of arc welding machine

Period	Maintenance item
Daily examination	Carry out a full visual inspection. Check for any damage to the machine, leads, cables and connections. Replace where necessary. Switch on the machine and check for any warning Led's and general operation
Monthly examination	Using the dry compressed air to clean the inside of arc welding machine. Especially check for build up of dust / debris on intake grills, main voltage transformer, inductance, Mosfet modules, the fast recover diode and PCB, etc. Take care when blowing electronic components and do not dislodge any wiring connections Check the security of output connections and plugs. Replace if signs of overheating.
Yearly examination	Carry out an annual service. Check earth continuity and insulation resistance of the machine at the relevant points. PLEASE NOTE THIS WORK SHOULD BE CARRIED OUT BY A TRAINED COMPETENT PERSON.

Troubleshooting

Before arc cutting machines are dispatched from the factory, they have already been checked thoroughly. The machine should not be tampered with or altered.

Maintenance must be carried out carefully. If any wire becomes loose or is misplaced, it maybe potential danger to user!

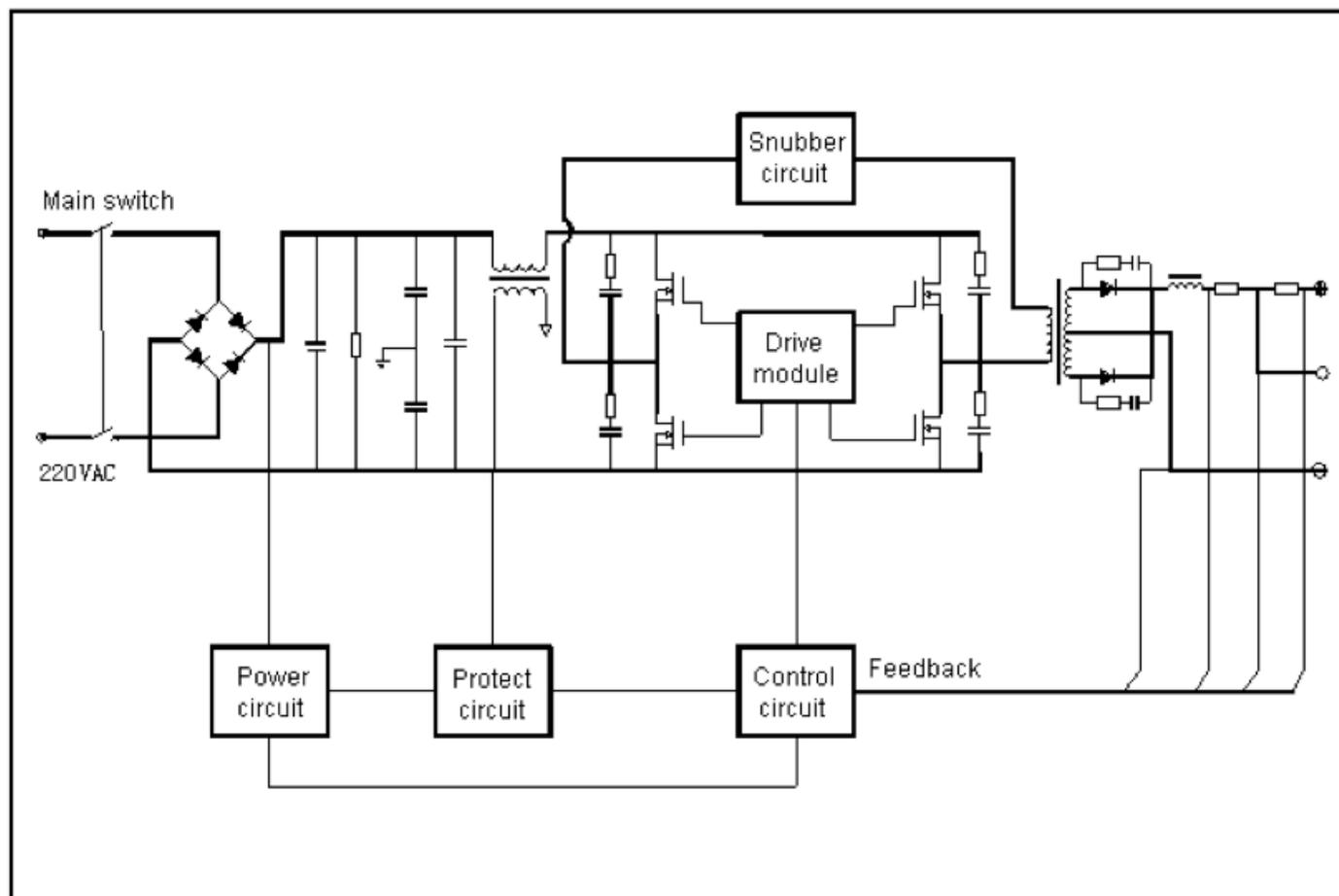
Only professional maintenance personnel should repair the machine!

Ensure the power is disconnected before working on the machine. Always wait 5 minutes after power switch off before opening the case.

Malfunction phenomena	Cause and solution
Turn on the machine, the power LED is on, but the fan does not work, and the control button does not function.	Over voltage protection occurs: Check if the mains voltage is identical with the working voltage of the machine.
Turn on the machine, the power LED is on, and the fan works. When pressing the control button of the cutting torch, the solenoid valve functions, and the red LED inside the machine is on or the yellow LED on the front panel is on.	Over current protection occurs: 1) The MOSFET on the top PCB is damaged. (The drive module is damaged.) 2) The control module is damaged. Overheating protection occurs: It is unnecessary to shut down the machine, and it will recover after a few minutes.
Turn on the machine, the power LED is on, and the fan works. When pressing the control button of the cutting torch, the solenoid valve functions, the red LED inside the machine is off, but there is no arc ignition.	The arc ignition part fails: 1) The air compressor inside the machine is damaged or not well connected. 2) Check the electrode and nozzle of the cutting torch. 3) The arc maintaining relay is damaged.
Turn on the machine, the power LED is on, and the fan works. When pressing the control button of the cutting torch,	1) The protective sleeve of the cutting torch head is not well installed. 2) The cutting torch trigger is damaged.

7

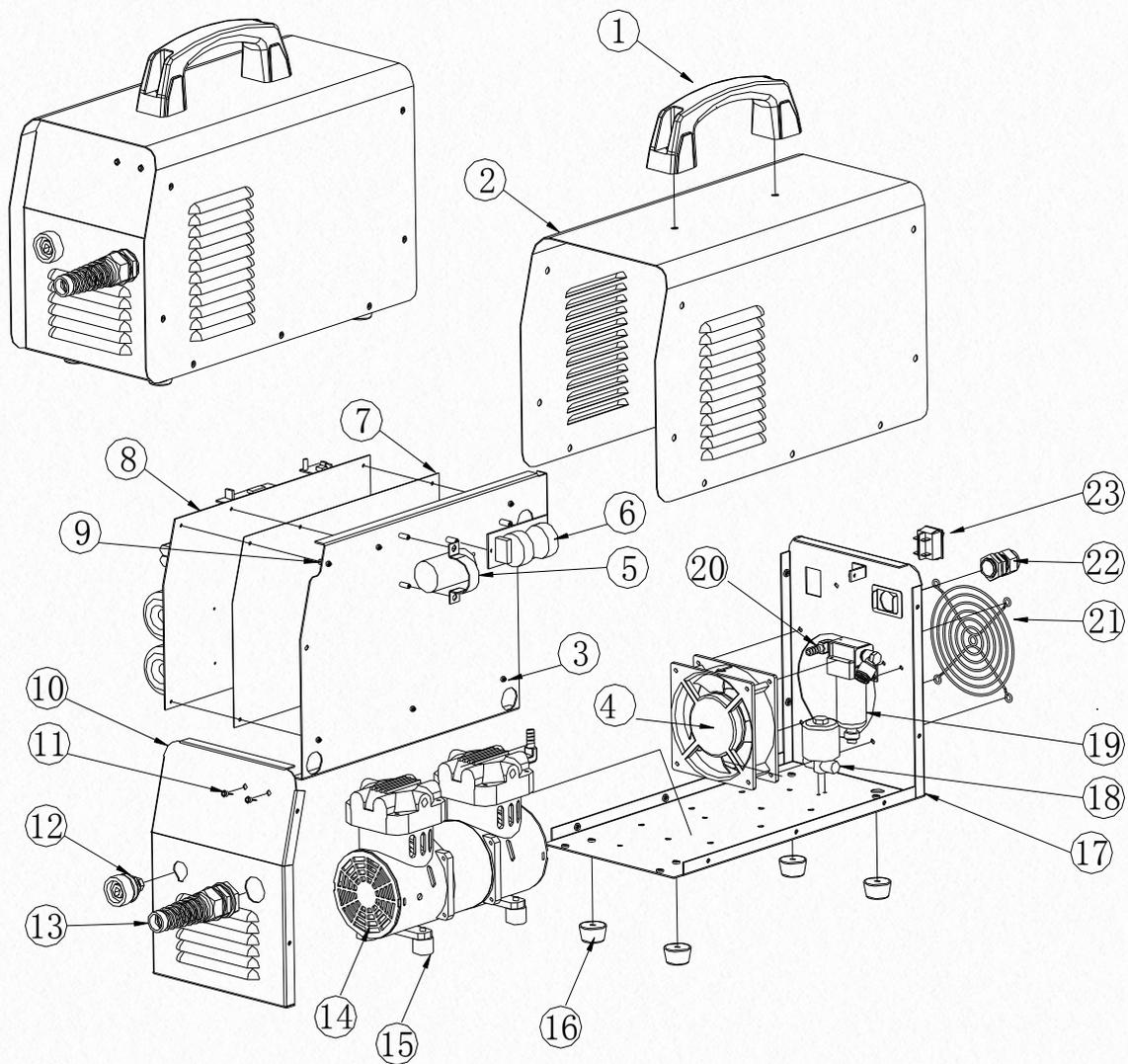
Electrical schematic



8

Parts list

Cut 25 - (JP-25C)



No.	Part no	Description	No.	Part no	Description
1	10027491	Handle	13	10021916	Spring Line button
2	10046083	Machine Cover	14	10043261	Air compressor
3	10046082	Central insulation board	15	10046113	Shock absorber
4	10001873	Fan	16	10016489	Foot
5	10046115	Clamp	17	10046058	Bottom panel
6	10020602	EMC board	18	10007278	Solenoid valve
7	10046084	Insulation Board	19	10044457	Filter
8	10044437	Main Board	20	10046076	Gas elbow
9	10022874	Steel stud bolts	21	10007331	Fan grill
10	10046056	Front Panel	22	10004886	Cable gland
11	10006368	Indicator lamp	23	10004946	Mains switch
12	10004637	Quick socket			

JP-25C AIR PLASMA CUTTING MACHINE

Order code JP-25C

© Wilkinson Star Limited

Issue 1 January 2014

Product is subject to change without notice